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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/931,125 09/16/97 LEE

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LMC1/0621

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EXAMINER

PORTKA, G

ART UNIT

PAPER NUMBER

2759

DATE MAILED:

06/21/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/931,125

Applicant(s)

Lee

Examiner

Gary J. Portka

Group Art Unit
2759



☒ Responsive to communication(s) filed on May 8, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-6 is/are pending in the application

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-6 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☒ The proposed drawing correction, filed on Apr 7, 2000 is ☒ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Continued Prosecution Application

1. The request filed on May 8, 2000 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 08/931,125 is acceptable and a CPA has been established. An action on the CPA follows.

2. Claims 1 and 3-6 have been amended by Applicant. Claims 1-6 remain pending.

Claim Objections

3. The disclosure is objected to because of the following informalities:

a. Claim 6 at line 12 is objected to because of the phrase "determining a predetermined disk drive". It is not apparent what must be determined when it has already been predetermined.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Claims 1-2 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Jones, U.S. Patent 5,572,660.

6. As to claim 1, Jones discloses a memory system comprising:

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a. Plurality of defect-adaptive devices (214-1 through 214-8) as claimed having a first region storing information needed for data recovery (parity), and a second region storing data (see Figure 2D, and column 10 lines 7-18);

b. Plurality of caches (254-1 through 254-8) respectively connected to the devices, each for storing parity information blocks needed for data recovery for the corresponding device (see Figure 2D, and column 10 lines 18-26);

c. Controller (210) connected to each device and cache, selectively controlling writing, reading, and obtaining of parity information to/from each memory device, and storing parity information obtained from a device in a corresponding cache (see column 2 line 62 through column 4 line 6, in particular column 3 lines 30-39; also column 10 passage cited above).

7. As to claim 2, Jones discloses that the controller determines if the information needed for data recovery is in the cache (see Figure 3D item 344, and Figure 3E item 370).

8. As to claim 6, Jones discloses a RAID system comprising:

a. Plurality of disk drives (214-1 through 214-8) with region storing data blocks and region storing parity information (see Figure 2D, and column 10 lines 7-18);

b. Plurality of caches (254-1 through 254-8) each connected to a corresponding drive and storing parity information (see Figure 2D, and column 10 lines 18-26);

c. Controller (210) connected to each disk drive and cache selectively controlling write of data and parity by:

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- i. Determining a disk drive upon receiving write instruction (see Figure 3A items 308 and 330);
- ii. Reading old data from the disk drive (see Figure 3C item 360);
- iii. If old parity to be read from disk is not accessed in the corresponding cache, reading the old parity from the disk drive, and loading the cache with old parity (see Figure 3E items 370, 376-378);
- iv. Obtaining new parity by performing XOR on old data, old parity and new data (see Figure 3F item 390, and column 9 line 16 equation);
- v. Loading corresponding cache with new parity (see Figure 3F item 392);
- vi. Writing the new data and new parity on the determined disk drive (see Figure 3F item 394, and column 3 lines 25-40).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones, U.S. Patent 5,572,660, in view of Holland et al., U.S. Patent 5,455,934.

11. As to claim 3, Jones does not disclose that the information needed for data recovery is sequentially arranged from the most outer cylinder. However, it is well known that the sequential

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nature of disk access invites a transfer mechanism sequentially from some position, thus improving performance by reducing seek time. As further taught by Holland, arrangement of information on a disk from the outermost cylinders results in higher sustained data transfer rates (see column 9 lines 25-30). It is clear from Jones at column 2 lines 34-58 that the accessing of the parity data in RAID systems limits the performance of these systems, and therefore the advantage of faster access due to reduced seek time, and higher sustained data rates would have motivated an artisan to arrange this information from the outermost cylinder. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to sequentially arrange the recovery information from the most outer cylinder in Jones, because this method reduces seek time, results in higher sustained data rates, and therefore improves performance..

12. As to claim 4, Jones discloses that parity information needed for data recovery is modified to a value obtained through a calculation of new data recovery information (see column 9 lines 8-21).

13. As to claim 5, Jones discloses XORing of previous data, corresponding parity information, and new data (see column 9 line 16 equation).

Response to Arguments

14. Applicant's arguments filed May 6, 2000 have been fully considered but they are not persuasive.

Examiner first notes that details disclosed in the Jones reference which were inadvertently overlooked in previous Office actions have been cited in the rejection above. It is believed that all arguments have been overcome as more fully stated in the rejections above.

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Conclusion

15. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) days from the mail date of this letter. Failure to respond within the period for response will result in Abandonment of the application (see 35 USC 133, MPEP 710.02, 710.02(b)).

16. **Any response to this action should be mailed to:**
Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:
(703) 308-9051, (for formal communications intended for entry)

or:
(703) 305-9731 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

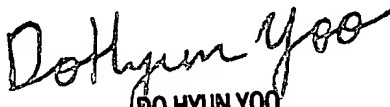
17. Any inquiry concerning this communication from the Examiner should be directed to Gary J. Portka at telephone number (703) 305-4033. The Examiner can normally be reached on weekdays from 9:00 A.M. to 5:30 P.M.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Do Yoo, can be reached on (703) 308-4908. The fax phone number for this Group is (703) 305-9731.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 305-3900.

GJP

Gary J. Portka
Patent Examiner
June 19, 2000


DO HYUN YOO
SUPERVISORY PATENT EXAMINER
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